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UNITED STATES DEPARTMENT OF AGRICULTURE

BULLETIN No. 848

OFFICE OF THE SECRETARY
Contribution from the Office of Farm Management
H. C. TAYLOR, Chief

Washington, D. C. June 22, 1920

AN ECONOMIC STUDY OF SMALL FARMS NEAR WASHINGTON, D. C.

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INTRODUCTION.

This bulletin presents the results of a study of the organization of small farms in the vicinity of Washington, D. C. Information was obtained regarding the important and outstanding farm practices followed on 152 small farms, and an analysis was made of the business of each of these farms to find out the amount of capital used, the kind and quantity of crops raised, the kind and amount of live stock kept, the nature and volume of receipts, the expenses incurred, the returns realized, and other facts bearing on the organization and operation of these farms.

In this study only those men were interviewed who depended on the returns from their farms as their main source of income. It was an economic study of farming on small areas in which each operator devoted most of his time to labor and supervision on the place. Men who had a regular occupation away from the farm and spent only evenings, holidays, and vacations on their farms were not included,

as their work was manifestly not comparable with that of men who worked regularly on the farm and could give close supervision to the different farm operations. Not many colored operators were found in this area and none was interviewed.

The data presented apply to the crop year 1916. The general conditions, as affecting yields of crops and prices, were fairly normal. The effects of the European War were not sufficiently felt at this time to change materially the profits in farming or management of farms in this region.

SUMMARY OF RESULTS.

The small farms visited in this survey were all devoted to trucking or market gardening. Over 50 per cent of their total crop area was devoted to vegetables and fruits, and 90 per cent of the receipts were from this source.

The average labor incomes realized, according to size of farm, were as follows:

Labor incomes.

Number of farms.	Farm area.	Tillable area.	Labor income.
	Acres.	*Acres.*	
45	11	6	$131
57	21	13	223
29	39	23	668
21	57	35	1,147

Land values are high for farming purposes. In most instances 5 per cent of this value exceeds the renting value of the farms. The landlords of the rented farms realized an average of only 2.9 per cent on investment.

Twenty to thirty per cent of the crop area is double-cropped. Labor incomes are materially increased by double-cropping, since thus the same equipment handles more acres of crops than in single-cropping and the production per acre is increased. Double-cropping is equivalent to increasing the average of cropped land. Intensive farming is necessary for success on small farms.

The farm produce is disposed of by hauling it to the city and selling it either at the public market stands (wholesale or retail) or through commission men.

Twenty-four farms, or 16 per cent of those studied, were operated by tenants. Twenty of the tenants paid a cash rent and the other four gave a share of the crops as rent. Thirty-six owners rented additional land and, in general, increased their profits thereby.

DESCRIPTION OF AREA.

Most of the farms visited were located in Prince Georges County, Md., or Fairfax County, Va. A few were in the District of Columbia. The farms in Maryland and Virginia were in the districts close to or adjoining the District of Columbia. The most distant farms were 14 miles from the Washington Center Market. None but small farms were visited.

The basic data for this bulletin apply only to the 152 farms covered in this study.

SOILS AND TOPOGRAPHY.

The predominating type of soil in the Maryland area is Leonardtown loam,[1] with small areas of Windsor sand and Susquehanna gravel. These soils are of the same geological formation. Leonardtown loam is a heavy type of soil and is silty rather than clayey in texture. It is capable of retaining considerable moisture during the entire growing season. Windsor sand is a medium to coarse sandy soil, containing a small amount of fine gravel. This soil is loose and friable and does not hold moisture well. Susquehanna gravel is distinctly stony or gravelly and is unsuited for ordinary farm crops. These two poorer soils usually constitute only a part of the farms in this area. The topography of the region is rolling to hilly.

In the Virginia area the farms were located largely on the Chester loam. soil.[2] This soil is a loam or silty loam that works up easily into a mellow, friable seed bed. It is well drained.

RAINFALL AND TEMPERATURE.

The rainfall for the year 1916 in Washington, D. C., was 38 inches, which was 5 inches less than the average. The rainfall for June and July, however, was above normal for those months. The season was cool, but there was abundant rainfall for the early summer vegetables and fruits. The month of August was dry for the late summer crops. The last killing frost in the spring was on April 11, and the first in the fall on October 1.

KIND OF FARMING.

The main business of the small farmers visited in this survey was raising vegetables and fruits for the local market. (See Table I.) The distribution of receipts, which is shown in a later table, indicates that about 90 per cent of the receipts were from crops.

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[1] Soil Survey of Prince Georges County, Maryland, U. S. Dept. of Agriculture.

[2] Soil Survey of Fairfax and Alexandria counties, Virginia, U. S. Dept. of Agriculture.

TABLE I.—*Average distribution of crop area on 152 small farms near Washington, D. C.*

	Tillable area (per cent of total crop area).			
	10 acres and under	11 to 20 acres.	21 to 30 acres.	Over 30 acres.
Field crops:				
Corn	10.2	6.6	17.3	19.2
Hay	11.4	12.8	17.2	20.6
Grain	.3	.2	4.0	3.7
Total	21.9	19.6	38.5	43.5
Vegetables:				
Potatoes	11.1	13.5	12.1	10.7
Sweet corn	8.9	5.7	7.5	8.6
Tomatoes	6.8	8.1	3.8	4.0
Spinach	2.9	5.1	3.5	2.5
Sweet potatoes	2.8	5.2	2.8	3.1
Turnips	3.5	5.8	2.9	2.1
Kale	3.1	4.8	2.8	2.2
String beans	5.7	3.7	2.4	2.5
Cantaloupe	2.9	3.2	2.1	2.0
Peas	3.5	2.6	1.4	1.1
Cabbage	1.5	2.3	2.2	.7
Lima beans	4.2	2.0	1.2	.7
Lettuce	.9	2.8	2.0	.3
Squash	.7	1.0	.4	.6
Peppers	.7	.5	.6	.5
Radishes	1.2	1.1	.2	.2
Asparagus	.7	1.0	.4	.1
Onions	.7	.7	.3	.5
Beets	.5	.9	.5	.2
Carrots	.5	.8	.6	.1
Cucumbers	.6	.6	.3	.2
Black-eyed peas	.8	.6	.3	.2
Parsnips	.2	.5	.6	(a)
Rhubarb	.2	.5	.3	(a)
Egg plant	.2	.4	.3	.1
Miscellaneous vegetables	2.1	.6	1.1	1.3
Total	66.9	74.0	52.6	44.5
Fruits:				
Strawberries	5.0	2.7	3.0	2.9
Apples	.3	1.0	2.2	3.4
Raspberries	1.5	.9	1.8	1.9
Blackberries	2.5	.8	1.0	.5
Miscellaneous fruits	1.2	.9	.9	3.3
Total	10.5	6.3	8.9	12.0
Flowers, total	.7	.1	(a)	(a)

a Less than 0.1 per cent.

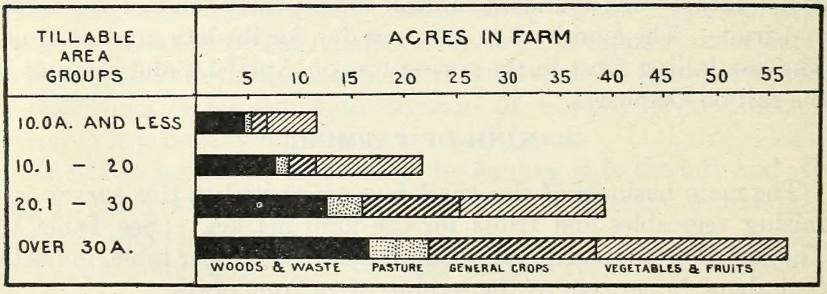


FIG. 1.—Distribution of farm area on 152 small farms near Washington, D. C.

Over 50 per cent of the crop area is devoted to vegetables and fruits (fig. 1). When the farms increase in area the proportion of land used for the general crops—corn, hay, and grain—increases, more of these crops being needed to feed the increased number of horses and other stock on the larger farms, and more land being available for this purpose. On many of the smaller farms no corn or grain is raised, necessitating the buying of feed. With a very limited amount of land available for crops, the farmer finds it more profitable to utilize the greater portion of it for raising crops of

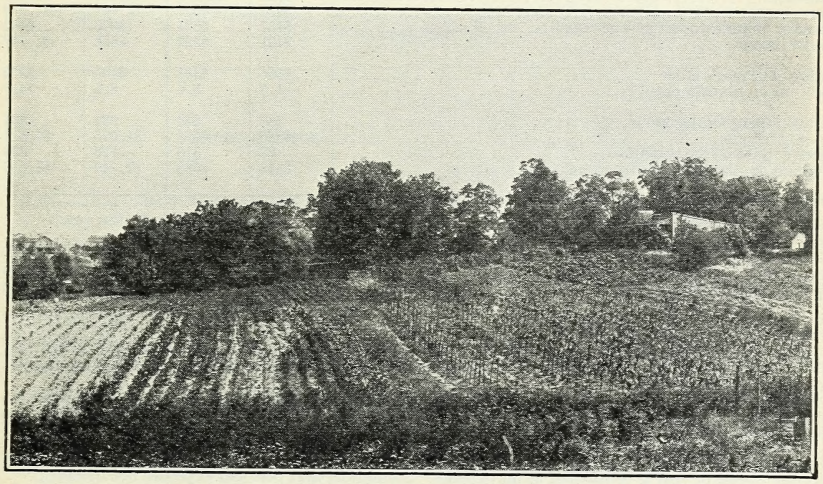


FIG. 2.—View of one of the small, highly intensified truck farms.

high market value and such as will furnish profitable labor for one or more men through the season. (See fig. 2.)

The live stock kept on these farms was practically limited to horses needed for farm work, and to cows, pigs, and chickens kept for the production of food for the family. The sales of live-stock products were negligible, with the exception of those of poultry products. The average flock for these farms was 33 chickens.

No greenhouses for raising vegetables for market were found in this area.

TABLE II.—*Summary of the farm business on 152 small farms near Washington, D. C.*

Item.	Tillable area.			
	10 acres and under. (45 farms.)	11 to 20 acres. (57 farms.)	21 to 30 acres. (29 farms.)	Over 30 acres. (21 farms.)
Farm area.....acres	11	21	39	57
Crop area.....do	6	13	23	35
Investment	$2,747	$6,430	$7,451	$8,636
Receipts	$794	$1,651	$2,478	$3,013
Expenses	$526	$1,107	$1,437	$1,434
Farm income	$268	$544	$1,041	$1,579
Interest on investment at 5 per cent	$137	$321	$373	$432
Labor income	$131	$223	$668	$1,147
Value of farmer's labor	$305	$351	$406	$372
Per cent on investment	—1.3	3.0	8.5	14.0
Value unpaid family labor	$88	$54	$34	$34
Family income	$356	$598	$1,075	$1,613
Interest paid on indebtedness	$8	$10	$26	$28
Amount available for family living	$348	$588	$1,049	$1,585
	Months of labor for the year.			
Hired labor	2.9	12.3	19.0	17.6
Operator and his family	15.3	14.0	13.2	13.2

NOTE.—Definitions of terms:

Investment.—The value at the beginning of the farm year of all real estate, machinery, live stock, and other investment used to carry on the farm business. It includes the value of the farm dwelling, but not the household furnishings.

Receipts.—All sales of crops, the net increase from stock, receipts from outside labor, increase of inventory of feed and supplies at end of year, rent of buildings, etc. Farm products retained for personal use are not included.

Expenses.—The amount of money paid out during the year to carry on the farm business, together with the value of the unpaid labor performed by members of the family. Decrease of inventory of feed and supplies at end of year is considered as an expense. Household and personal expenses not included.

Farm income.—The difference between receipts and expenses.

Labor income.—The amount that the farmer has left for his labor after 5 per cent interest on the investment is deducted from the farm income. It represents what he earned as a result of his year's labor after the earning power of his investment has been deducted.

Per cent on investment.—The rate returned on the farm investment after the value of the farmer's labor is deducted from the farm income.

Family income.—The sum of the farm income and value of unpaid family labor, or the amount available for family living had there been no interest to pay.

PROFITS.

In Table II is shown a general financial summary of the farms visited. It will be noticed that the 45 farms having an average crop area of 6 acres have the smallest investment, and that their income is also the lowest. Only five of the farmers of this group made a labor income of over $400. It thus can be seen readily that the chances for making a large income on farms of under 10 acres in this region are not very good. It is the exceptional farmer who can make more than a living on such farms without any outside source of income.

The incomes increase very rapidly with increase in the number of tillable acres available. The second group of farms, having 11 to 20 acres tillable, make an average labor income of $223. Two out of every five farms returned labor incomes of over $400. The farmers in the other two size-groups made labor incomes averaging over $400.

The prospective farmer should study this table carefully. If the farm he has in view falls in the smallest size-group, for example, he need not assume that he can not do better than the average did, as indicated in Table II, since many of these farmers made much more than the average (see fig. 3). He must bear in mind at the same time that it will require the best management and a considerable knowledge of farm practice and markets, and that most of the farm work will have to be done by himself and his family, if he is to succeed on one of these very small farms.

FARM RECEIPTS.

TABLE III.—*Distribution of farm receipts on 152 small farms near Washington, D. C.*

Source of income.	Tillable area.			
	10 acres and under.	11 to 20 acres.	21 to 30 acres.	Over 30 acres.
	Per cent.	*Per cent.*	*Per cent.*	*Per cent.*
Vegetables	70.0	83.8	80.3	72.7
Fruits	12.0	7.6	9.5	12.0
Flowers	2.2	.6		
General crops	.1	.2	1.7	2.9
Poultry	4.9	3.5	2.0	3.9
All other stock	.1	.3	.8	2.0
Miscellaneous	10.7	4.0	5.7	6.5

Table III shows the distribution of farm receipts. Over 80 per cent of the receipts are from vegetables and fruits. The live-stock receipts outside of poultry are practically negligible. This table indicates clearly the type of farming followed by these farmers. The comparative importance of miscellaneous receipts for the group of very small farms is due mainly to income from outside sources. Some of the men on these farms do team work, a few work at trades, and still others do ordinary day labor when their farm work is not rushing, though a small proportion of the year is spent at outside work. This additional income is often necessary on very small farms, as the farm receipts are not enough to furnish a living for the family. All farms with outside receipts that exceeded the farm receipts were excluded from consideration in this study. The smaller farms also sell the most flowers and small fruits, thus increasing their business by more intensive production. The farmer with limited acreage must make up for lack of land by raising crops which yield a high return per acre. These crops usually require so much hand labor that the farmer who works many acres will not compete in raising them.

FARM EXPENSES.

In Table IV is shown the relative importance of the different items of expenditure. It will be seen that in the group of very small farms there is a relatively high expense for family labor, which must be

charged against the business, whether actually paid for or not. The expense for hired labor is low compared with that for the large farms. In other words, the small business on these little farms would not justify a big expenditure for labor. It should be explained that "family labor" is the farmer's estimate of what he would have paid had he hired some one to do the farm work done by his family.

TABLE IV.—*Distribution of farm expenses on 152 small farms near Washington, D. C.*

Item of expense.	Tillable area.			
	10 acres and under.	11 to 20 acres.	21 to 30 acres.	Over 30 acres.
	Per cent.	*Per cent.*	*Per cent.*	*Per cent.*
Hired labor	15.4	32.9	39.7	38.0
Family labor	16.7	4.9	2.4	2.4
Feed	24.5	17.9	11.1	10.0
Seed	5.4	4.4	4.4	5.0
Fertilizer and manure	4.0	6.3	8.7	7.6
Marketing and commission	11.0	14.0	15.3	16.6
Repairs and depreciation	13.8	9.8	10.2	11.3
Insurance and taxes	4.3	5.4	3.8	3.7
Miscellaneous	4.9	4.4	4.4	5.4

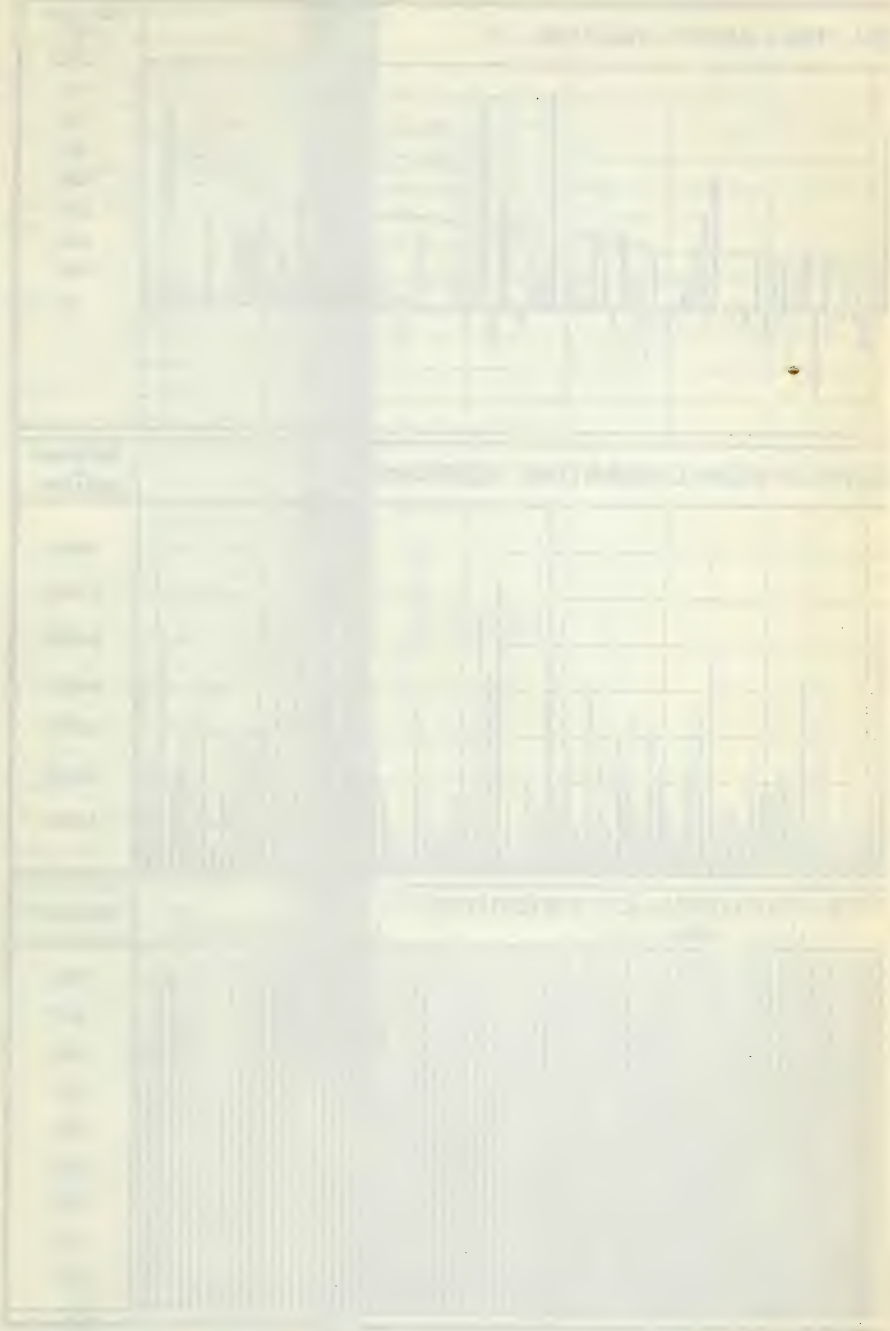
The man on the small farm has to buy much of his stock feed. He usually lives in a region of small farms, where most of his neighbors are also truckers, and he is forced to buy most of his feed from feed stores rather than directly from farmers, and thus has to pay dealer's prices. He has not enough land to produce the more cheaply-raised feeds such as hay, corn, and corn fodder.

In studying Table IV as a whole it will be noticed that the larger farms are spending relatively more money than the others for labor, fertilizer, and marketing, and less for feed. In other words, they are paying out the most for the three big items of farm expenses, which on truck farms indicate greater production.

CAPITAL.

TABLE V.—*Average distribution of capital per farm on 152 small farms near Washington, D. C.*

	Tillable area.			
	10 acres and under.	11 to 20 acres.	21 to 30 acres.	Over 30 acres.
Real estate	$2,434	$5,830	$6,506	$7,397
Dwelling	638	861	1,076	1,458
Other buildings	131	300	593	648
Live stock	144	262	422	601
Machinery	97	188	266	248
Feed and seed on hand	15	34	99	171
Cash to run farm	57	116	158	219
Total capital	2,747	6,430	7,451	8,636
Renting value of farm	134	208	212	297



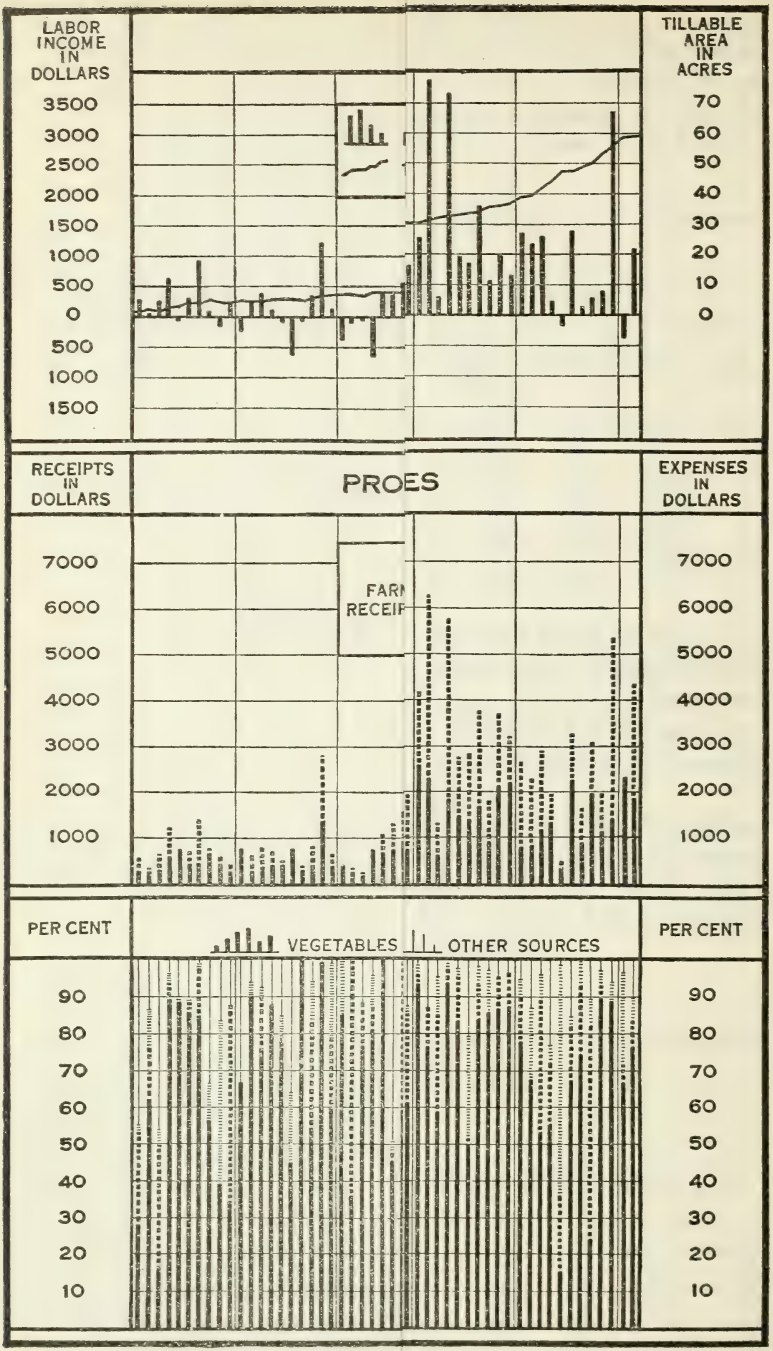


FIG. 3.—Relation of tillable area to laboion of receipts, by individual farms (152

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In Table V is shown the distribution of capital used in the operation of these farms. Nearly 90 per cent of the total capital is in real estate. The live-stock and machinery investment is low per farm and the value per acre of the farms relatively high. The farms are located close to the city, giving them, in some instances, valuations which are greater than they would be were it not for the influence of suburban real estate values. This speculative factor very often controls the real estate values of small farms located conveniently to market. To determine the effect of this factor for the farms studied, the renting value for farming purposes of each farm was determined. It will be noticed (Table V) that for the smallest farms the renting value approaches very nearly 5 per cent interest on the real estate value. This is probably due to the fact that these small farms are worth very nearly $234 a year merely as a home for the family of a man working in the city. On the larger farms 5 per cent on the real estate investment is nearly $100 greater per year than the annual cash rent for farming purposes.

COMPARISON OF INDIVIDUAL FARMS.

In the previous paragraphs it is shown that in studying groups of farms the labor incomes, on the average, are greater on the large farms. This, however, does not hold true uniformly when individual farms are considered, as is shown in figure 3 and Table VI. There are some farms with good incomes and some with poor incomes in each size-group. The size of farm has an important bearing on the chances of success in farming, but other factors, such as good crop yields, good prices for farm produce, and suitable equipment, which may be grouped under the heading of good quality of business, may more than overbalance unfavorable size of farm. These individual variations emphasize the fact that the men who rank as conspicuously successful farmers rank far above the average in quality of business. The farmer who is content to be merely as good as the average need not hope to be classed among the more successful operators of his community.

TABLE VI.—*Tillable area, labor income, capital, receipts, expenses and distribution of receipts for each of 152 farms near Washington, D. C.*

[Farms arranged according to size of labor income.]

Labor income.	Tillable area.	Investment.		Receipts.	Expenses.	Per cent of receipts from—			
		Real estate.	Other.			Vegetables.	Fruits.	Stock.	Other sources.
$3,805	30.5	$2,000	$721	$6,244	$2,303	76	12	.....	12
3,654	32	5,500	807	5,789	1,820	93	5	1	1
3,584	25	8,000	1,789	7,940	3,867	98	.....	1	1
3,534	56	6,000	1,156	5,330	1,438	89	.....	4	7
3,342	26.3	7,000	1,346	5,614	1,855	80	20	.....	.....
2,931	14.5	6,000	1,138	5,546	2,258	99	.....	.....	1
2,194	18	3,300	715	4,578	2,183	88	11	.....	1

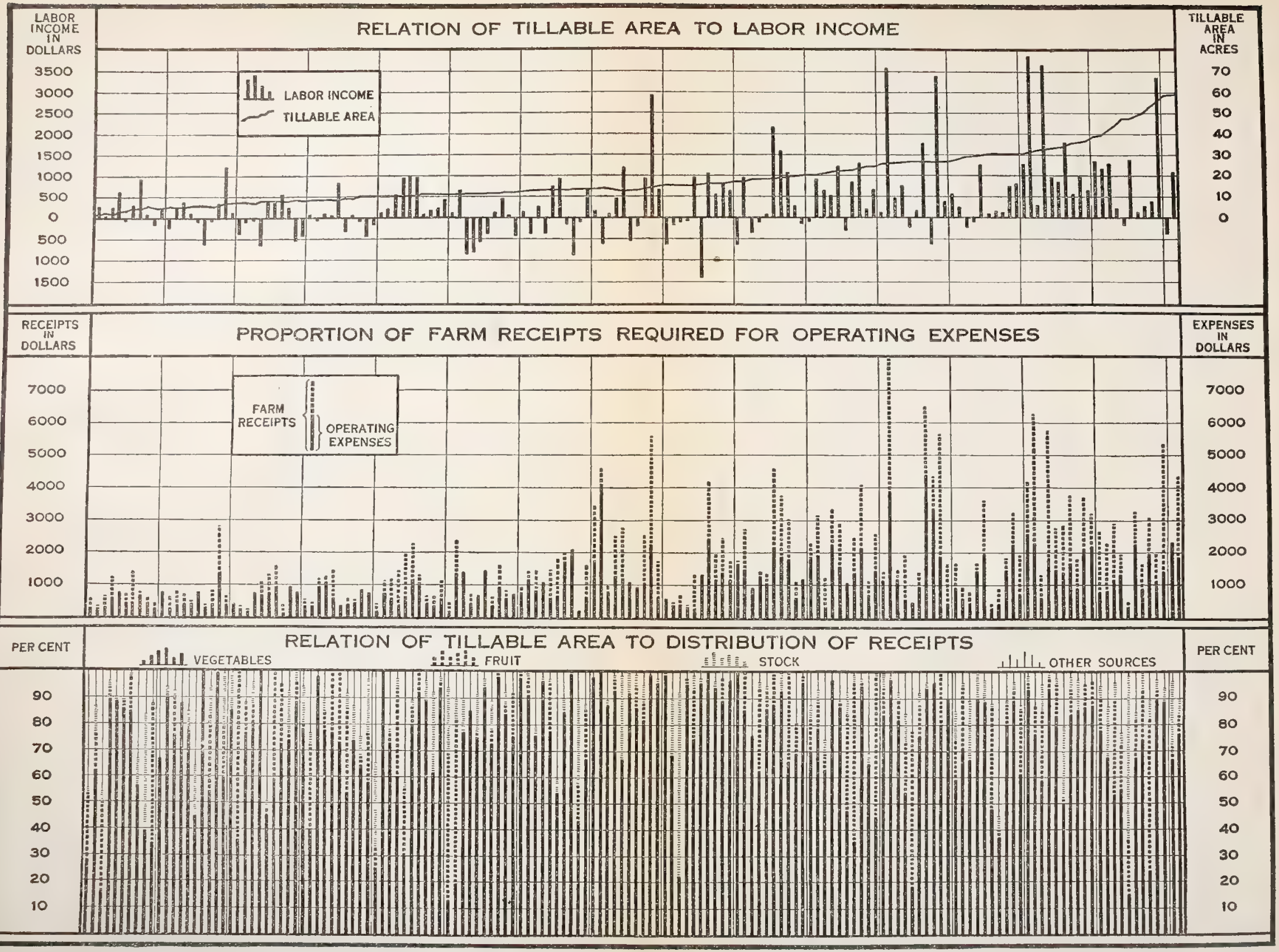

FIG. 3.—Relation of tillable area to labor income, proportion of farm receipts required for operating expenses, and relation of tillable area to distribution of receipts, by individual farms (152 small farms near Washington, D. C.). Each line represents one farm.

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TABLE VI.—*Tillable area, labor income, capital, receipts, etc.*—Continued.

Labor income.	Tillable area.	Investment.		Receipts.	Expenses.	Proportion of receipts from—			
		Real estate.	Other.			Vegetables.	Fruits.	Stock.	Other sources.
$1,785	33.5	$6,000	$1,083	$3,753	$1,614	84	9	6	1
1,740	26	5,200	1,914	5,494	4,398	93	.....	2	5
1,590	18.62	5,000	1,595	3,773	1,853	92	.....	8	.....
1,566	59	16,700	2,279	4,390	1,875	77	8	5	10
1,436	39.25	8,000	1,084	2,664	774	78	12	4	6
1,362	48	2,400	726	3,270	1,752	78	13	2	7
1,273	42	8,000	1,216	2,894	1,160	52	37	7	4
1,271	23	12,000	1,263	4,061	2,127	94	1	2	3
1,266	30	5,500	1,170	4,148	2,548	93	2	3	2
1,234	29.5	5,000	1,261	3,531	1,984	89	.....	8	3
1,216	13	5,900	977	2,757	1,197	68	.....	31	1
1,213	21.5	3,250	1,151	2,977	1,544	87	1	1	11
1,206	6.4	5,000	611	2,791	1,304	99	.....	1	.....
1,120	39.5	6,200	1,154	2,276	788	68	.....	19	13
1,056	19	2,100	631	2,974	1,781	66	34	.....	.....
1,008	15.5	13,600	757	4,191	2,465	100	.....	.....	.....
998	10	5,000	868	1,917	626	31	24	2	43
984	36	10,000	1,340	3,680	2,129	87	8	.....	5
971	17	5,400	554	2,739	1,470	85	15	.....	.....
965	32.5	5,445	1,638	2,809	1,490	83	11	3	3
955	15	1,500	207	1,322	282	73	22	5	.....
951	10	2,200	335	1,419	341	60	33	3	4
948	10.2	2,500	600	2,253	1,150	80	7	2	11
928	12	4,500	293	1,784	616	53	.....	7	40
923	14.1	1,400	646	2,057	1,032	82	6	7	5
920	3.5	1,200	358	1,486	488	84	13	2	1
897	20	4,800	1,045	3,128	1,939	79	10	4	7
847	32.8	10,000	1,620	2,867	1,439	50	1	28	21
835	22	3,500	1,401	2,469	1,389	36	59	4	1
816	9	1,000	374	1,445	560	76	23	.....	1
802	16	4,000	1,260	2,418	1,353	89	8	.....	3
800	30	6,500	931	1,855	683	61	24	1	14
767	30	3,500	1,064	3,227	2,232	89	3	3	5
762	25.4	2,500	638	1,431	512	54	19	10	17
716	12	2,000	309	1,403	572	78	17	1	4
675	23.5	7,500	758	2,521	1,433	44	55	1	.....
658	10.5	6,000	827	2,317	1,318	19	73	8	.....
651	14.8	8,000	634	1,719	636	96	.....	1	3
645	20.4	3,400	307	1,173	343	62	7	5	26
644	12.5	5,000	277	1,554	646	67	19	1	13
609	37	6,000	1,162	3,152	2,185	88	9	.....	3
604	2.8	400	152	1,244	612	89	3	2	6
575	8	1,100	266	1,565	922	59	40	.....	1
531	16	5,000	688	1,963	1,148	92	.....	2	6
513	35.3	5,500	1,022	1,727	888	86	.....	11	3
509	27	3,100	542	1,624	933	59	16	10	15
507	10	2,000	503	1,158	526	73	2	4	21
502	21	10,000	1,832	3,363	2,269	97	.....	.....	3
483	25.35	4,500	1,278	1,890	1,118	81	9	1	9
475	13	14,000	871	2,495	1,276	93	5	1	1
453	11	2,500	421	1,539	946	98	2	.....	.....
417	10.4	1,710	434	1,084	560	94	1	1	4
387	8	3,500	493	1,317	730	45	1	4	50
383	5	1,000	164	811	370	76	14	2	8
366	26.5	15,000	988	1,579	414	90	.....	.....	10
362	8	1,445	116	1,079	639	100	.....	.....	.....
343	6.4	1,200	416	833	409	54	29	10	7
336	53	10,000	1,198	1,972	1,076	90	3	3	4
314	32	7,100	1,250	1,252	520	59	26	10	5
286	19.5	3,500	382	1,075	595	69	11	.....	20
269	50	15,000	1,366	3,081	1,994	24	58	8	10
258	3.5	1,150	200	732	406	85	2	1	12
252	11.75	5,300	794	1,422	865	76	.....	2	22
229	5	1,500	259	598	281	90	.....	3	7
225	1.7	1,300	174	527	228	28	27	1	44
225	10	2,500	383	1,081	712	100	.....	.....	.....
223	1.82	2,000	345	630	290	62	33	4	1
217	4.5	600	116	456	203	34	52	.....	14
211	8.1	1,100	203	386	110	72	23	.....	5
210	28	2,310	610	902	546	71	24	1	4
208	44	4,000	1,306	1,944	1,471	55	17	4	24
202	10.4	750	477	597	334	61	.....	30	9
168	23.2	4,670	534	1,098	670	64	.....	4	32
156	26	5,500	674	1,414	949	76	11	4	9
143	12.75	9,800	557	2,446	1,785	98	.....	.....	2
133	16.2	7,000	782	1,647	1,125	96	.....	.....	4
132	10.4	1,500	303	649	427	89	.....	8	3
120	30	5,000	1,154	1,872	1,444	80	7	2	11

TABLE VI.—*Tillable area, labor income, capital, receipts, etc.*—Continued.

Labor income.	Tillable area.	Investment.		Receipts.	Expenses.	Proportion of receipts from—			
		Real estate.	Other.			Vegetables.	Fruits.	Stock.	Other sources.
$116	49	$10,000	$2,053	$1,599	$880	73	19	8	.....
103	6.5	2,500	347	601	356	60	19	20	1
102	11.5	1,140	409	882	703	98	2	.....	.....
92	11	2,500	396	608	371	72	4	13	11
89	10	3,000	428	465	205	25	7	32	36
83	25	2,500	627	1,353	1,114	83	11	6	.....
79	8.8	3,000	413	1,190	940	98	.....	.....	2
67	5.3	4,000	511	691	398	88	.....	.....	12
59	18	3,025	531	1,283	1,046	86	6	1	7
59	13	3,600	573	994	726	87	.....	3	10
56	8.5	3,000	308	533	312	78	1	15	6
53	30	8,000	719	896	407	37	3	4	56
53	10.3	3,000	546	1,285	1,055	92	8	.....	.....
52	9.5	1,500	352	560	415	53	34	4	9
49	30	2,500	242	393	207	48	38	.....	14
41	10.5	3,000	287	449	244	13	55	25	7
32	9	2,800	539	1,246	1,047	77	7	6	10
29	1.77	900	209	331	247	62	14	10	14
17	11.3	4,000	545	799	555	83	4	4	9
3	4.4	1,200	319	743	664	56	.....	11	33
— 28	7	700	146	209	195	76	12	.....	12
— 35	6	800	144	309	297	100	.....	.....	.....
— 38	8.8	3,240	173	443	310	40	31	4	25
— 42	5.5	2,000	118	464	400	79	1	5	15
— 50	15	1,200	315	373	347	96	2	.....	2
— 50	29.5	5,000	807	1,642	1,402	90	.....	9	1
— 50	3	700	78	734	745	88	.....	2	10
— 61	12.5	1,400	188	212	194	42	15	28	15
— 73	15	5,500	789	640	399	22	.....	70	8
— 77	18	3,250	560	1,344	1,231	62	36	1	1
— 85	7	3,000	283	318	239	36	63	.....	1
— 96	10	3,500	262	554	462	74	.....	13	13
— 97	20	10,000	343	2,261	1,841	70	12	5	13
— 126	19.75	2,000	874	1,174	1,156	97	2	.....	1
— 134	10	1,000	97	633	712	58	19	23	.....
— 142	15	3,125	229	423	397	68	.....	21	11
— 168	4.5	6,000	454	568	413	39	1	43	17
— 177	12.1	7,460	970	2,000	1,755	84	.....	6	10
— 199	48	6,000	631	455	322	16	20	53	11
— 204	13.5	3,100	609	910	929	86	7	6	1
— 209	25.5	1,000	312	350	493	18	59	.....	23
— 215	28.9	10,000	663	790	472	67	.....	21	12
— 223	4.6	2,000	354	649	754	67	.....	.....	33
— 304	9.3	775	225	105	359	73	27	.....	.....
— 335	22	4,500	557	943	1,025	48	35	8	9
— 337	12	4,900	621	963	1,024	97	.....	1	2
— 347	11.7	12,000	258	1,381	1,115	91	7	2	.....
— 386	7	4,500	173	237	389	85	.....	15	.....
— 392	18	2,000	564	672	936	76	.....	.....	24
— 397	59	5,500	1,203	2,249	2,311	67	4	27	2
— 405	11	2,650	370	1,196	1,450	94	.....	3	3
— 408	8.5	1,000	225	422	769	88	9	3	.....
— 452	11.4	8,000	278	653	691	75	16	.....	9
— 482	10	2,000	220	469	840	64	2	9	25
— 533	8.5	6,200	392	790	993	74	3	15	8
— 554	13.3	1,380	669	610	1,062	92	.....	8	.....
— 580	11	10,000	597	634	684	75	1	15	9
— 613	8	8,000	365	535	730	81	6	10	3
— 620	17	12,600	651	1,716	1,673	100	.....	.....	.....
— 626	13	20,000	2,014	4,529	4,054	100	.....	.....	.....
— 634	15	7,200	463	309	560	99	.....	1	.....
— 634	5.75	7,000	628	500	753	44	.....	20	36
— 638	26.25	32,250	855	4,333	3,316	96	.....	.....	4
— 809	12.5	15,000	322	1,985	2,028	99	.....	1	.....
— 837	11	4,200	290	788	1,401	77	.....	13	10
— 840	11	21,000	263	700	477	85	.....	.....	15
—1,406	15.5	22,000	517	1,046	1,326	96	.....	1	3

TRUCK-CROP YIELDS.

Below are shown the average yields per acre of the important truck crops on the 152 farms (season of 1916). No direct relation was found between the acreage yields and size of farms.

The 11-peck barrel is standard throughout. The tomato box, squash crate, and cantaloupe crate hold 4 pecks each. The berry crates hold 32 quarts.

Average yields per acre of truck crops.

Irish potatoes	barrels	40	Peas	barrels	23
Sweet potatoes	do	45	Kale	do	41
Sweet corn	dozens	381	Spinach	do	70
Tomatoes	boxes	152	Squash	crates	190
Lima beans	quarts	1,172	Cantaloupe	do	112
String beans	barrels	37	Strawberries	do	69
Cabbage	do	116	Blackberries	do	46
Carrots	bunches	10,902	Raspberries	do	37
Beets	do	7,960			

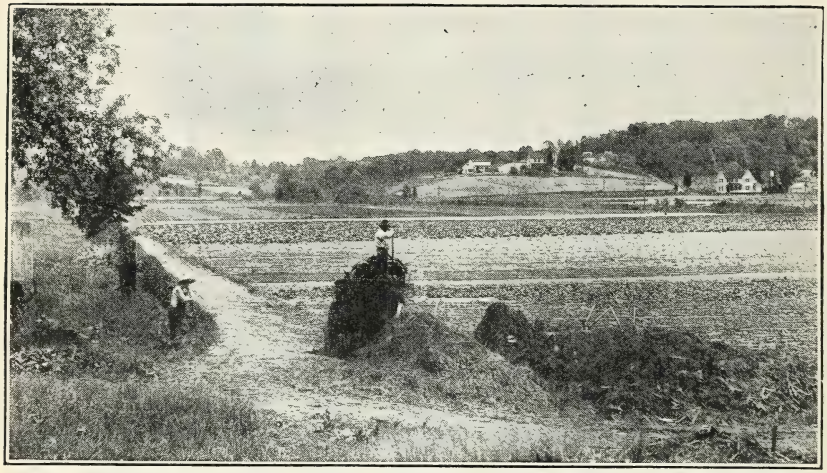

FIG. 4.—Stable manure brought from the city is dumped on compost heap.

MAINTAINING SOIL FERTILITY.

On small truck farms it is not possible to keep up the fertility of the soil by keeping live stock, as on general and dairy farms. The common method of keeping up the yields of crops on these farms is by the use of purchased barnyard manures and commercial fertilizer. About three-fifths of the expenditure for manure and fertilizer is for fertilizer, and two-fifths for manure. Much manure, however, is used for which no money is paid. Many farmers haul it from stables in Washington, where they get it for taking it away. Often after taking a load of produce to the Washington market the farmer will bring back a load of manure for his compost heap. Some farmers contract for all the manure produced at a stable, in which case it is necessary to make one or more trips every week for manure alone. The manure is usually put on a large pile, from which it is drawn in to the field as needed (fig. 4). The actual value of manure used

is probably greater than that of the fertilizer used. The supply of stable manure in the city is limited, however, and some farmers are unable to get the required amount.

The importance of maintaining enough humus in the soil is appreciated by all the experienced farmers. Barnyard manure is their chief reliance for this purpose, though rye, crimson clover, or cowpeas are sown occasionally, to be plowed under as green manures. The growing of winter cover crops could be practiced to good advantage much more commonly. Most of the crops grown on these farms are cultivated throughout the summer, furnishing an excellent seedbed in the fall for rye or some winter legume to be plowed under the following spring. Such crops furnish considerable humus to the soil, which the trucker finds it increasingly difficult to supply, and also tend to prevent serious washing of the soil in the spring. The winter cover crop should be plowed under while the stems are still succulent, and the land then very thoroughly worked before the truck crop is planted.

INCREASING ACREAGE BY DOUBLE-CROPPING.

Much of the crop land on these farms is double-cropped. The farmers with 20 acres and under of tillable area raise two crops during the year on about 30 per cent of their crop land, and those with over 20 acres of tillable area raise two crops on about 20 per cent of their crop land. This is a profitable method of increasing the crop acreage on small farms. The above-mentioned two groups of farms were subdivided into two groups each, those double-cropped on less than 25 per cent of their crop area, and those double-cropped 25 per cent and over of their crop area. The labor incomes of the farmers in the first group were $89 for those double-cropping less than 25 per cent of their crop area and $295 for the rest, while in the second group the labor incomes were, respectively, $658 and $1,162.

The importance of having crops growing all the time can not be overemphasized. Many truck crops require only a portion of the season for reaching maturity. *If it is not possible to follow or precede the short-growing crop with another truck crop, a winter cover crop or summer legume should be sown, to be plowed under to improve the soil.*

The number of acres double-cropped also materially affects efficiency in the use of horses. The crops worked per horse for the above-mentioned groups as subdivided on double-cropping were 5.9 acres for those in the first group who double-cropped less than 25 per cent of their crop area, and 9.1 for the rest, and 10.7 and 12.7 acres, respectively, for those in the second group. The efficient employment of horses is very important on these small farms, where

more horse feed is usually bought than on the larger, general crop farms. The renting value of the farm and investment in machinery and tools are also made less per acre of crops when double-cropping is increased.

Early peas or early potatoes may be followed by string beans, late potatoes, turnips, spinach, kale, or radishes. Winter or spring grains, if cut for hay, may also be followed by these crops. Winter cover crops should be plowed under just before they head out, and, after being thoroughly worked into the soil, may be followed by any crop normally planted after the last spring frost. Many other successions might be suggested, but each farmer must plan to suit his own conditions. The point is to plan for high production per acre.

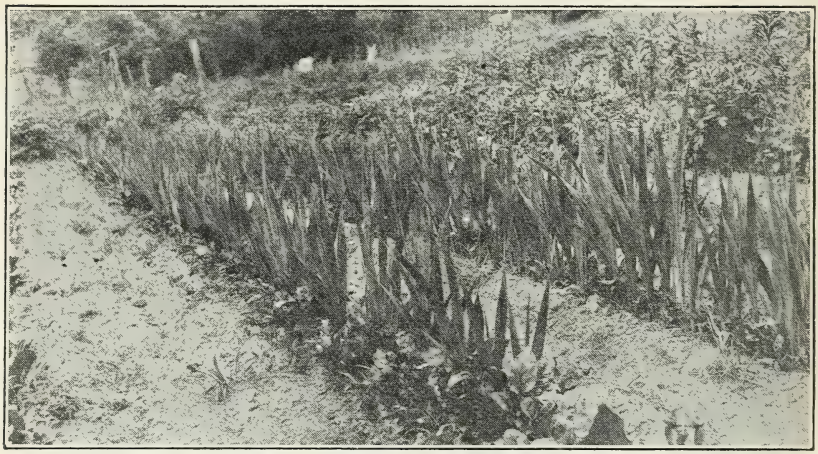

FIG. 5.—Beets and gladioli in same row, permitting use of horse cultivator in intercropping.

Intercropping is often practiced to good advantage. Late vegetables may be planted between the rows of earlier vegetables, allowing the late crop to grow while the earlier ones are maturing. One example was found of planting early and late maturing plants in the same row (fig. 5) allowing for horse cultivation.

In this connection it should be pointed out that over two-fifths of the farms visited had less than half their farm areas in crops, the remainder being woodland, scrub land, waste land, and a negligible part in pasture. The half of the farm in crops had to pay interest and taxes on the other nonproductive half. As the tillable area decreases in proportion to the total farm area, the business becomes smaller and in addition is increasingly burdened with idle capital. When all the farms having 30 acres and under of tillable land are sorted into two groups, those in which the tillable area is 60 per cent and less of the farm area and those in which it is over 60 per cent of

the farm area, it is found that the former group returned an average labor income of $73 and the latter an average of $468. Obviously, on such small, high-priced farms the amount of waste land should be reduced to a minimum.

MACHINERY AND TOOLS.

But one-third of the farmers with 10 tillable acres and under have more than one horse. The equipment on these farms usually consists of a one-horse wagon, a one-horse plow, a spike-tooth harrow, a one-horse cultivator, a work harness, and necessary hand tools. Each of these farms also reported 17 hotbed sash on an average. (See fig. 6.)

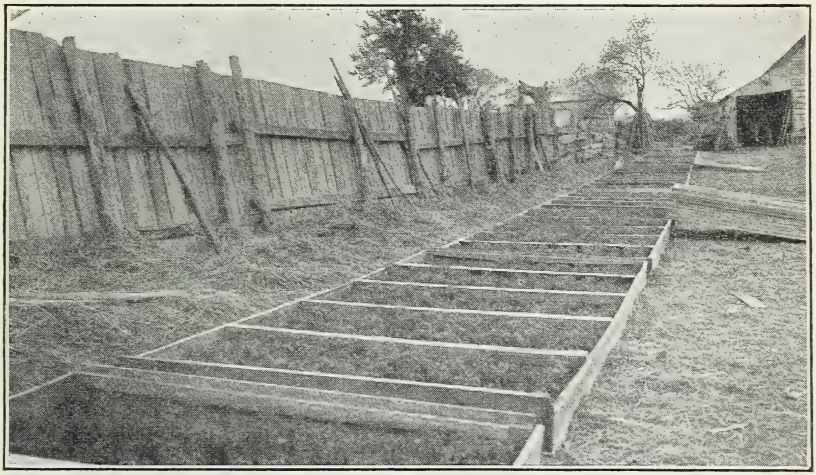

FIG. 6.—Tomato plants in hotbeds. Board fence gives protection from cold winds.

The large farm usually had both a two-horse and a one-horse wagon. The number of cultivating tools increases with the size of farm, occasionally including a disk harrow or spring-tooth harrow. About half of the farmers have mowing machines. The number of hotbed sash increases with acreage up to a certain point, the greatest number being found on the farms of 11 to 20 tillable acres, averaging 50 per farm.

It is very evident that the operators of the very small farms are at a disadvantage in not having enough land to keep two horses busy, thus necessitating the use of one-horse tools, which waste man labor. When plowing and harrowing and all hauling must be done with one horse, the farmer is manifestly not using his time to best advantage. Much farm labor, to be done economically, requires the use of at least a two-horse equipment.

Two-thirds of the farmers visited had hotbeds for starting early tomatoes, early cabbage, eggplant, peppers, and other early crops.

An early crop usually commands a good price, and the land on which it is grown may be used for growing another crop the same season. Hotbeds are sometimes profitably utilized for growing lettuce very early in the spring and very late in the fall.

MARKETING THE PRODUCE.

Marketing the produce is really a part of the regular farm operations on these farms. The work on the farm is so arranged as to allow the required number of men and horses to deliver the vegetables and fruits regularly to the open market in Washington. A short discussion of this subject thus seems warranted in connection with the study of the management of these farms.

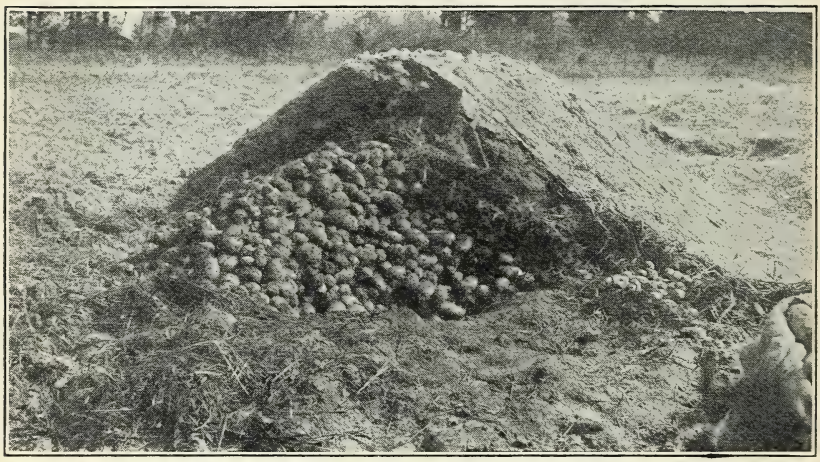

FIG. 7.—Potatoes buried in pit covered with straw and earth. The potatoes were buried in October, and the picture was taken the following May.

Most of the vegetables and fruits raised are of perishable nature and must be marketed when harvested. Irish potatoes are sometimes stored to be held for a better price or a more convenient time of marketing. They are put in cellars or buried in pits. (See fig. 7.)

The produce of all the farms visited was sold on the Washington market. A very few farmers hire their produce hauled and pay a definite commission for hauling and selling. The common practice for the farmer is to do the hauling himself with his farm horses and wagons. The men on the larger farms are beginning to use motor trucks. The average haul to the market for all farms is 9 miles, and the average number of trips to market for all farmers was about 75 a year, the number of trips varying with the quantity and variety of produce grown.

The farmers sell by wholesale, retail, or commission. The city of Washington has a wholesale market which opens at 3 o'clock every

weekday morning. Most of the farmers are there by that time. The produce is sold mostly between 3 and 7 a. m. If the farmer has not sold out by 7 o'clock he generally has to sell at a sacrifice. The buyers, retailers, hotel men, boarding-house keepers, or brokers haul the produce away from the farmers' wagons. The farmer who wholesales is usually home on the farm by noon.

Those who retail sell on retail markets, which are separate from the wholesale market. They sell direct to the consumer, and this process usually occupies the greater part of the day. It is generally the farmer with a small acreage of crops who sells on the retail market. The farmer with a big acreage can not dispose of all his produce in this manner.

The grower who sells by commission also delivers his produce to the city, but the commission man does the selling. The grower may return home immediately upon unloading, provided he does not have to wait for the containers, which the farmer is supposed to get, regardless of the method of selling. The usual commission is 10 per cent of gross sales.

Thus it can be seen that marketing is no small part of the operation of these farms. Table IV shows that from 11 to 16 per cent of the farm expenses are for marketing. This is about 10 per cent of the gross crop sales. It includes only the actual cash expenditures incurred in marketing, such as market-stand fees, lunch, and horse feed, and does not account for the time of men and teams required to haul produce to market. Here, again, the farmer who has but one horse is at a disadvantage. He can not haul more than the one horse can draw. He is hauling and selling a one-horse load while he could just as easily sell a two-horse load.

In grouping farms of the same size according to the average price received for their produce, it appears that the farmers receiving the highest prices also get the highest labor incomes. The better prices are partly due to better marketing methods, and reflect better quality of produce, better pack, and having the produce ready early in the season. The trucker, therefore, should aim to raise a crop above the average in quality as well as quantity, and to get it on the market before the bulk of the crop for the section is marketed.

FARM PRODUCTS RETAINED FOR HOME USE.

In a discussion of profits on small farms something should be said regarding the relative importance of farm products retained for home use. The results of this study indicate that the family on the small farm does not get as much food directly from the farm as does the family on the larger farm. For instance, the families having no

cow, and therefore having to buy all the milk and butter used, included three-fourths of the families on the smallest farms, one-half of those in the second size-group, and one-fourth of the families on the 21 to 30 acre tillable area. The size of poultry flocks was larger on the larger farms and the consumption of home-produced poultry and eggs was also greater on those farms. The average consumption of home-produced pork for family use was 223 pounds on the farms of 10 tillable acres and under, and 447 pounds per family on the farms of 21 to 30 acres. No attempt was made to determine the quantity of fruits and vegetables kept for home use, but a great variety of these are raised on all farms and the variation in home consumption on different-sized farms was probably not great.

To the family moving from the city to a small farm the farm products furnished directly by the farm may seem very important, but comparing them to the value of those usually furnished on the larger farm, they are relatively unimportant. The man on the small farm usually specializes in production and often does not find it profitable to keep a cow, chickens, and pigs, for raising food for home consumption only. On larger farms these stock are more often kept as regular farm enterprises, making much more meat and other animal products available for home use.

TENURE.

Table VII shows the relation of tenure to profits and type of farming. Only 16 per cent of the farms studied were operated by tenants. Twenty of the tenants paid a cash rent, and four gave a share of the crops as rent. The share was usually one-half of the crops, the landlord paying one-half of the expenditure for seeds and fertilizer, and all the taxes, insurance, and repairs on buildings.

TABLE VII.—*Relation of tenure to type of farming and profits on 152 small farms near Washington, D. C.*

	Owners.	Owners renting additional land.	Rented farms.	
			Tenants.	Landlords.
Number of farms	92	36	24	
Tillable area, acres	18.3	20.5	13.6	
Acres of crops	18.9	23.0	16.6	
Per cent crop receipts are of total receipts	89	89	96	
Capital	$5,633	$4,475	$464	$5,222
Farm income [1]	$666	$845	$405	$152
Interest on investment [2]	5.8	11.3	25.0	2.9

[1] *Farm income:* Receipts less expenses.
[2] Percentage farm income less value of farmer's labor is of the investment.

The type of farming followed by the renters is very clearly indicated by the fact that 96 per cent of receipts are from crops. The average rent paid for the 24 farms was $162 a year. It is to the ad-

vantage of the tenant to raise as much as possible, since he must pay his rent before he can pay himself.

In a comparison of owners we find that those who rented additional land operated more land with a given amount of capital than those who did not. In a region where land values are high because of city speculative values, it may pay better to rent than to buy additional land in order to increase the farm business. It will be noticed that the landlords made only 2.9 per cent on their investment—another indication of the advantage of renting additional land. The farmer with sufficient capital to buy naturally prefers to own his place, but if the place is small he should not hesitate to rent additional land, if possible, in order to increase his profits.

The tenants required a relatively small amount of capital. The farm income of the tenants is less than that of the owners, but if the interest on the capital invested is deducted the net income or labor income is about the same for both groups. The prospective farmer with the necessary experience but with little capital can do better by renting than by buying until he can afford to get a farm of sufficient size for profitable operation.

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